Project to Block Arctic Current Awakens Hope in Frozen Newfoundland

New England Too Would Get Milder Climate by Damming of Belle Isle Strait—Riker's Plan for Gigantic Jetty at Cape Race Is Recalled—Frigid Waters Gaining Influence Over Gulf Stream.

By ROBERT G. SKERRETT.

PLANS now crystallizing in Newfoundland may lead to a marked amelioration of the somewhat rigorous climate of a part of our New England States. The people of the Maritime Provinces are by no means primarily bent upon bettering the atmospheric conditions along our coast as their aim is to help themselves by blocking the present free sweep of the Labrador Current southward through the Strait of Belle Isle and into the widespread waters of the Gulf of St. Lawrence.

This is not the first time that the scheme has been agitated, but the outlay heretofore has loomed prohibitively large. To-day, because of the recent conflict, we speak in billions where we hesitatingly mentioned millions prior to 1914, and the public mind has become accustomed to discuss freely immense engineering undertakings and commensurate expenditures. Thus we have come to look further ahead and thus to discount present heavy costs by their prospective benefits. Therefore the citizenry of Newfoundland is keen to construct a great dam squarely across the throat of the Strait of Belle Isle and thus shut the door in the face of the frigid and intrusive arctic current.

Interferes With Shipping.

It is into the Strait of Belle Isle that the Labrador Current so frequently drives great masses of field ice and towering bergs to menace navigation during the spring and summer months when the glacial Northland releases these perils to shipping. At other times, the Labrador Current surges into the Gulf of St. Lawrence, chills the contiguous air, and sets back for weeks vegetation's response to the rays of the northing sun. According to our hydrographic experts, describing the drift of ice and bergs in the grip of the Labrador Current:

"By the middle of January the shores of Newfoundland and Gulf of St. Lawrence are full of ice which has been frozen there, and are opened or closed by a favorable or adverse wind. Navigation in the River St. Lawrence is closed about the middle of November and does not open until about May. A wind from northwest to southwest will clear the eastern coast of Newfoundland, while the Gulf of St. Lawrence may remain full of ice until the first of May. Even after this date much ice is found in the Gulf until July, and by August or earlier the field ice is replaced in the Strait of Belle Isle by bergs."

Plainly, the arctic flood that enters the Gulf of St. Lawrence by way of the Strait of Belle Isle is one potent aid to the development of local ice by chilling the waters so that they will freeze early. This, quite apart from the intrusion of bergs and floes from Labrador, closes the St. Lawrence River to navigation for months when movement to and from the sea would be of great economic moment to Canada.

No wonder, then, that Newfoundland is anxious to seal the Strait of Belle Isle so as to keep away from a part of the Maritime Provinces the repressive effects of the Labrador Current. Just where the barrier will be reared is yet to be determined, because the hydrographic conditions in that waterway are such as would inevitably make such a structure difficult and costly to build. The throat of the Strait is in the neighborhood of Forteau Bay, where the span from shore to shore is ten miles. Even so, the soundings show depths ranging from 32 to 62 fathoms (192 and 372 feet). Nothing approaching a dam of such length and height has yet been erected. Further to the eastward, where the distance across is about eighteen miles, the soundings show depths of 17, 20, 43 and 18 fathoms across the Strait from Wreck Bay to Cape Norman. Here the shallower water and more moderate currents, even with a wider interval to be closed, would make it easier to plant the obstruction. In either case, the enterprise would call for the expenditure of a vast sum.

Millions in Land Values.

It is argued as an offset that the climatic modifications, which would be effected by shutting out the Labrador Current, would induce enormous agricultural increases and raise the value of the lands by billions of dollars. Further, we are told that the exclusion of the Labrador Current from the Gulf of St. Lawrence would permit the warm waters of the Gulf Stream to swing in nearer to the coast, thus tempering the cold months and making the St. Lawrence River as well as the Gulf navigable the year round. Logically, if these claims are warranted, a portion of neighboring New England would be benefited more or less, the advent of spring being measurably speeded up and the cold season modified for the better.

This Canadian project is scarcely more than a nibble into the problem of achieving radical benefits through the balking of the present flow of the Labrador Current. Seven years ago an American mechanical engineer, Carroll Livingston Riker of New York city, who has done notable things in the realm of hydraulic engineering, boldly proposed the building of a giant jetty projecting to the south and east from Cape Race directly across the main path of the southbound Labrador Current. In laying his scheme before Congress a year later Mr. Riker claimed that he could accomplish this amazing result at an expenditure of $20,000,000! He purposed effecting this by drawing upon the forces of nature in such a way as to induce both the Gulf Stream and the Labrador Current—especially the latter—to rear a great sandy bulwark right athwart its own present sweep.

While this sounds somewhat chimerical, still there is much more of the practicable in the proposal than may be apparent at first. The reasonableness of Mr. Riker's assumption becomes clearer if we pause to analyze the probable circumstances that have led to the gradual creation of the Grand Bank—that monster plateau of sand which rises from the bed of the Atlantic Ocean 2,000 feet down, until its widespread and nearly level crest lies on an average only something like 250 feet below the surface of the sea.

Piling Up for Centuries.

In the centuries gone the Labrador Current has been draining from the Arctic Basin tremendous quantities of sand, which it has carried steadily southward. In a like fashion heavy floes of ice, which have scoured the shores of Labrador, have picked up earth and gravel en route, while the monster icebergs, the offspring of glaciers, have moved from Greenland and elsewhere within the Arctic Circle masses of rocks and gigantic boulders. The earthen and rocky freight of the ice floes and the bergs has been set free when these derelicts of the frozen North have come within the warm waters of the Gulf Stream south and east of Newfoundland. In dropping to the ocean floor they have fallen directly astride the course of the sand laden Labrador Current, thus inducing the latter to part with some of its gritty burden.

Successively, from year to year, in the ages past, the Labrador Current instead of underruning the Gulf Stream without serious interference has been forced more and more surfaceward by the steadily rising Grand Bank—an obstacle in the main of its own forming. In a kindred fashion, but to a lesser extent, the Gulf Stream has carried sand northward and has helped to upbuild from the south the great barrier which to-day brings the frigid waters of the arctic current and the warm flood from the tropics into disastrous conflict in the neighborhood of Newfoundland—robbing the Gulf Stream of the major part of its beneficent heat and modifying radically its further paths of travel.

We are authoritatively informed that the Gulf Stream, from the time it breaks clear of the battleground over the Grand Bank, is but a relatively puny remnant of the erstwhile river of the sea which used to carry its transforming warmth far into the realm where Jack Frost now dominates. Proof of this, some experts declare, is given by the remains of tropical flora and fauna which have been uncovered in the glacial regions of the Arctic.

Gulf Stream Once Ran Freely.

In the ages gone, we are told, the Labrador Current probably dived into the depths of the Atlantic, leaving the Gulf Stream to hold unimpeded sway at and near the surface. In those days the Gulf Stream in all likelihood held closer to the continental shores from Cape Hatteras northward, stabilizing climate conditions and making the coastal seasons more nearly like those which at present prevail in Bermuda. And then the upreraring of the Grand Bank began until finally the Labrador Current insinuated itself between the continent and the Gulf Stream—bringing its Arctic chill next door to us and shoving further seaward the northbound ocean river emanating from the Gulf of Mexico. And that the Labrador Current has been steadily widening its foothold at an alarming extent is seemingly evidenced by data supplied by the Government's hydrographic investigations within recent decades.

Contiguous to Cape Race the Labrador Current has scoured out a channel about twenty miles wide and approximately 500 feet deep, through which it sends southward continuously a vast volume of very cold water. It is said that this passage furnishes an easier outlet for the southern discharge from the Arctic basin than does the opening into the Pacific by way of Behring Strait. That is to say, more of the frigid flood now enters the Atlantic than was formerly the case. Charts are extant which show that the Cape Race Channel of the Labrador Current has deepened more than one-third since 1877. As lately as 1853 charts published by the United States Coast and Geodetic Survey indicated a movement of water from the Arctic Ocean into the Pacific Ocean at a rate of one-half mile an hour. Those printed in 1877 show a contrary movement from the Pacific into the Arctic Ocean at the increased rate of two miles an hour. Logically there must be a corresponding outlet; and official publications dated no further back than 1908 warrant the conclusion that the balancing discharge is southward into Baffin Bay, with the Labrador Current carrying the icy volume onward contiguous to our shores and thence by the Gulf Stream's very outlet right into the Gulf of Mexico!

The Gulf Stream's Power Gauged.

And what is the nature of that single monster river in the ocean, as the late Lieut. Matthew Fontaine Maury called it, which the Labrador Current, through the agency of the Grand Banks, has been able to set astray and whose primordial force and function have been offset by it disastrously? Lieut. Maury has said that the Gulf Stream issues northward between Florida and the Bahama banks as "a jet of warm water more than three thousand times greater in volume than the Mississippi River." To be more specific, this tropical flood, which has a surface temperature in the wintertime off Cape Hatteras of quite 80 degrees and 500 fathoms down still registers 57 degrees, flows through the "Narrows" at the rate of 90,000,000,000 tons of water hourly. Lieut. Maury further says: "Taking only the difference in surface temperature as an index of the heat accumulated there, a simple calculation will show that the quantity of heat daily carried off by the Gulf Stream from those regions and discharged over the Atlantic is sufficient to raise mountains of iron from zero to the melting point, and to keep in flow from them a molten stream of metal greater in volume than the waters daily discharged from the Mississippi River."

Think, then, of the tons of coal that must be burned by us in the winter time to make up for the losses imposed upon us by the intrusion of the Labrador Current! According to Mr. Riker's figures, the volume of the Labrador Current averages about 50,000,000,000 cubic yards of water per hour. This is more than half that of the Gulf Stream where it passes out on its northern journey between Bemini and Cape Florida. Mr. Riker says, "It would require the burning of more than 1,000,000 tons of coal per minute to heat this mass of ice water from 35 to 55 degrees." Conversely, the arctic current robs the Gulf Stream to that measure of its warmth and capacity to temper the atmosphere with which it is in contact.

Now, to Count the Cost.

The Riker project of constructing a barrier or peninsula of submerged sand reaching from Cape Race seaward for a distance of 200 miles, and having a width of forty miles at its coastal end and three miles broad at its outer extremity, would seem a well nigh prohibitive undertaking. But this seemingly herculean task simmers down to a relatively simple matter if nature's forces be called into play to repeat at man's dictation the arresting of the sandy burden carried southward by the Labrador Current. As Mr. Riker explains it: "If this material can be obstructed in its southerly movement at and about the site of the proposed jetty, it becomes evident that it would form a sandbar that would continue to build in width and height until it reached the surface of the ocean. It only remains for man to place an obstruction that shall maintain a position a few inches above the constantly rising surface of the material that is deposited to effect the deposit of all the heavy matter that is in movement—no interference in any way with the current of the water above being required."

As to the character of this promoting agency Mr. Riker adds: "It is here proposed and submitted that this obstruction shall be effected by an obstructor to be stretched across the Grand Bank, over the proposed site, in the form of a great rope cable, or its equivalent, that has been saturated with asphaltum and weighted with wire or otherwise, giving the requisite specific gravity or weight to cause it to sink in the ocean and rest lightly upon the bottom, and having lesser specific gravity than the sand or other deposit, it will thereby be prevented from sinking into or being buried by the deposit by virtue of its greater buoyancy—it being heavier than the water, but very much lighter than sand in sea water.

"This obstructor should be so anchored as to be supported against the pressure of the southerly flow of the current against its side throughout its entire length, and still have unrestrained vertical movement, to insure which it should be anchored by a series of kedge anchors, at short intervals, and the connecting ropes should be supported by buoys so that they shall not become embedded in the sand, and serve to prevent the natural upward movement of the obstructor upon the top of the sand or other deposit as it forms—thereby insuring the unfettered vertical movement of the obstructor as it is buoyed up higher and higher by a rising surface of the deposit. The wave action upon the buoys will, to an extent, be transmitted to the anchor ropes and, by them, in a lesser degree to the obstructor." This intermittent tugging serving to break the grip of the gathering sand, and thus continually holding the cable upon the crest of the accumulating mound.

In elaborating his scheme, Mr. Riker explains: "An obstructor may be of any form, and often should be made to meet special conditions. Usually the more flexible vertically the better. It seems from careful investigation by the best authorities that for about seven-eighths of the distance to be traversed by the jetty the bottom would be almost perfectly smooth and level. For one-eighth of the distance just east of Cape Race the bed is not so level, but apparently a perfect bottom for the operation of the obstructor. In considering the certainty of this method of construction it must be remembered that more than three-quarters of this upbuilding will occur below the influence of wave action, and seven-eighths below the serious influence of wave action.

"The amount of material that is now being moved by the Labrador Current can be increased by the least disturbance of the bottom sands to the north of the site of the proposed jetty. A slight disturbance at the bottom at one point may inaugurate a cut or movement by the current amounting to millions of yards of the bottom. Because of the almost perfect static balance or readiness to move on which now exists there, I firmly believe that the proposed investigation will demonstrate the probability that at least three-quarters of the present flow of the Labrador Current over the Grand Banks can be stopped by its own deposits within two years from the placing in position of the obstructor. This jetty when completed would be just south of the Virgin Rocks and the East Rocks, and would seem to be but the resurrection of the Virgin Peninsula, apparently the original coastal formation thereabout at no very ancient period.

"The United States Government charts show an erosion or increased depth over great areas upon this site to have been one-third in less than twenty years, equivalent to the removal of a dam the height of a man's head reaching from New York to Chicago, through which clear space ice cold water is pouring along our coast where none passed twenty years previously, and which is increasing year by year. If this is not checked the climatic conditions along our Atlantic seaboard will grow continually worse. The increasing coldness of the waters in and about New York harbor, and the more frequent and denser fogs thereabout, of which there is no question, are corroborative proof that this Arctic flood is actually upon us, and at the rate of increase shown by the Government reports fifty years will convert our coast into a semi-Labrador." Mr. Riker sums up in verse the potential consequences of recourse to his obstructor:

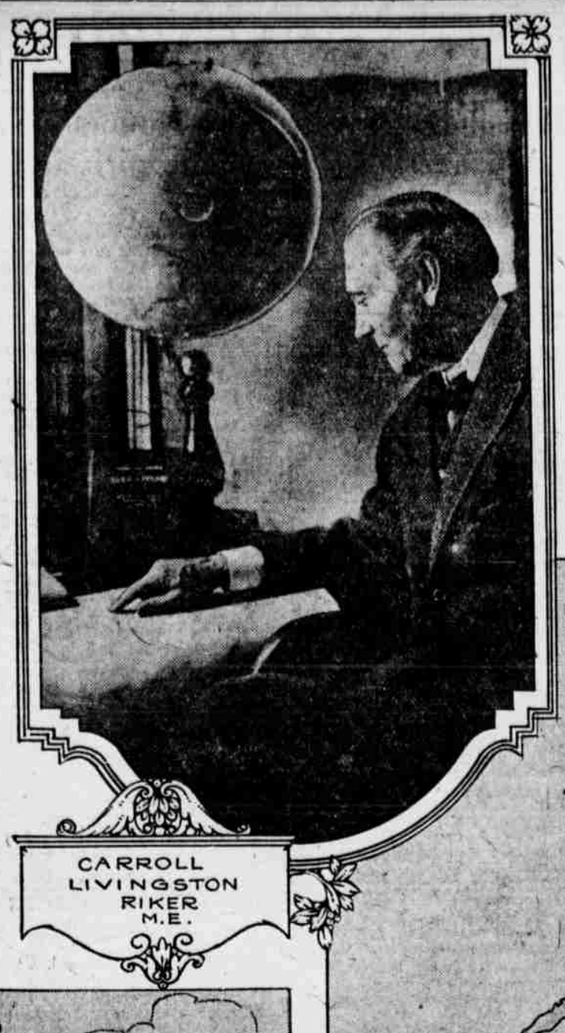
Unimpeded drops of water, and impeded grains of sand,
Will change the ocean's bottom and the surface of the land.
And
The like of woman's hairpin and the shoestring of the man,
With the aid of friendly nature, will construct this mighty dam.

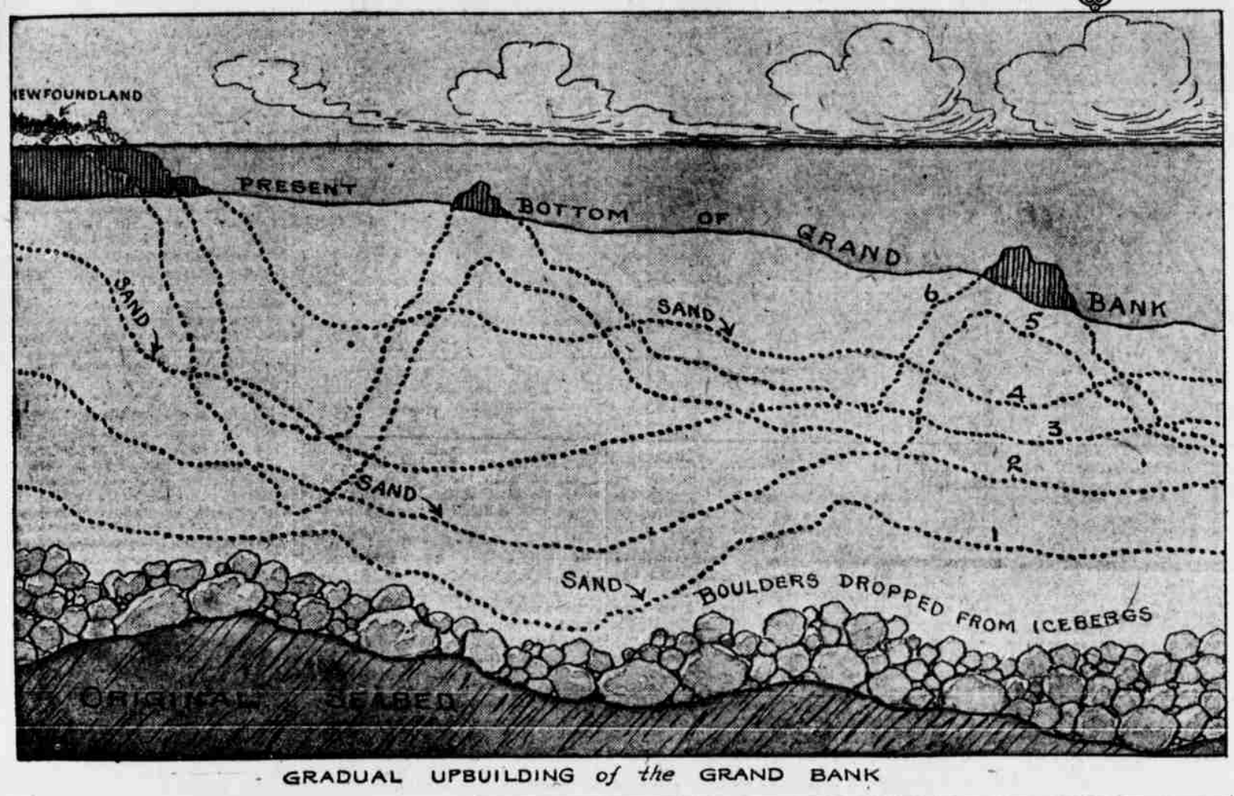
Thefts of Great Tracts of Coast.

The upbuilding of the Grand Bank in the course of time has actually robbed us of great tracts of our coastal region. Evidence of this exists to-day in deeds of Jersey farms that have long since disappeared before the gnawing attacks of the Atlantic's hungry waves, and this process of erosion continues. These stolen sands have been carried northward by a backset or offshoot of the Labrador Current and have thus contributed to the upreraring of the vast subaqueous plateau contiguous to Newfoundland. At the same time sands of polar origin have swept south and stranded upon the Diamond Shoals which help to make Cape Hatteras more hazardous and to force shipping further seaward. Mr. Riker claims that the forming of his jetty will reverse these actions. That is to say, the Jersey coastline will be restored to its ancient contour and the sands now off Hatteras will be largely swept away.

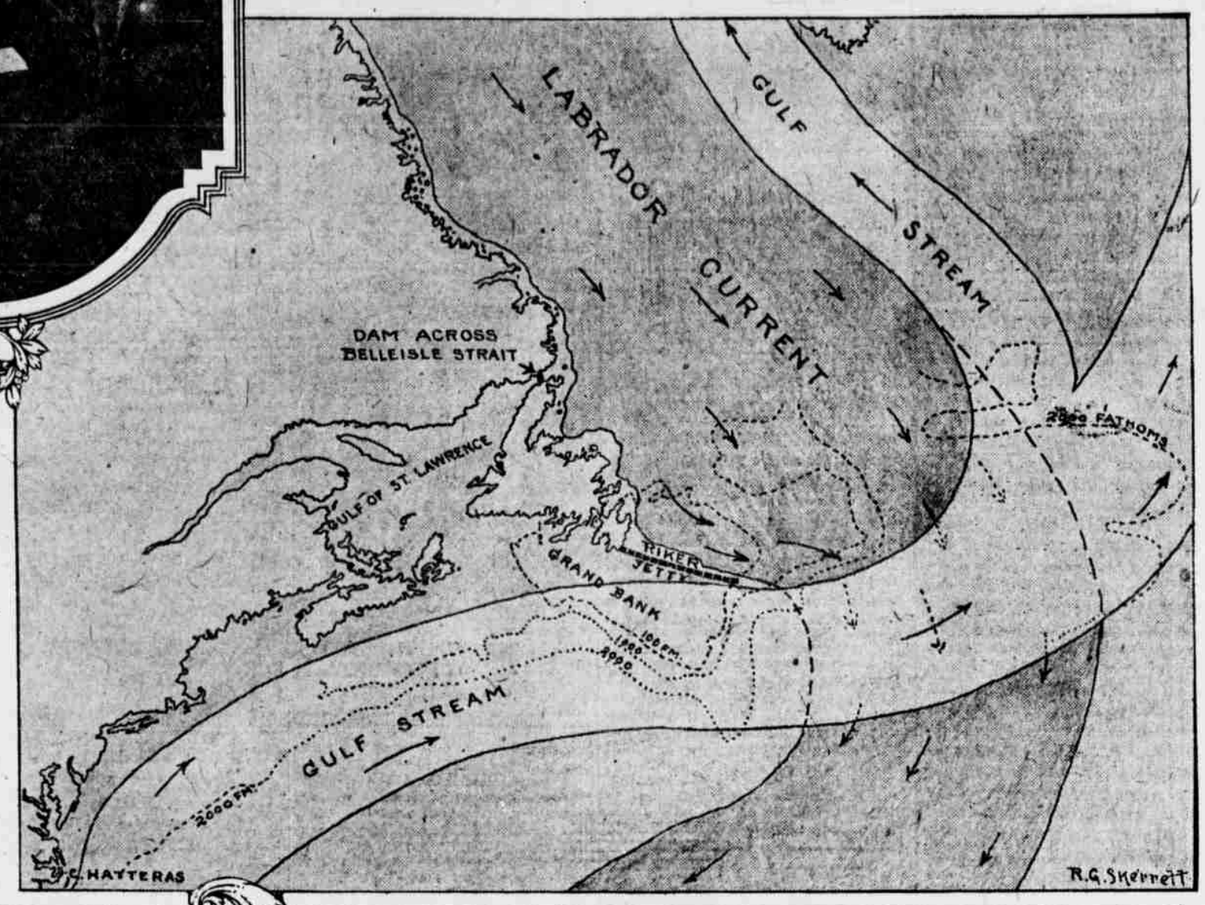
The easterly winds which to-day set the surf digging into our beaches will be supplanted by westerly winds, which in their turn will tend to create counter currents under water, and the latter will bring back to us the substance which used to form our beaches and our headlands. By balking the Labrador Current at the Grand Bank and preventing its assault upon the Gulf Stream Mr. Riker is confident that the warm tide, then flowing unhampered into the Arctic zone, would serve to melt the ponderous ice which now covers vast areas there. The resulting water would, in consequence, move Equatorward, and the northern hemisphere would incline more directly toward the sun, thereby promoting a temperate climate where Jack Frost to-day holds sway, and incidentally bringing the reach of twenty-four hours of daylight further southward during the summer months.

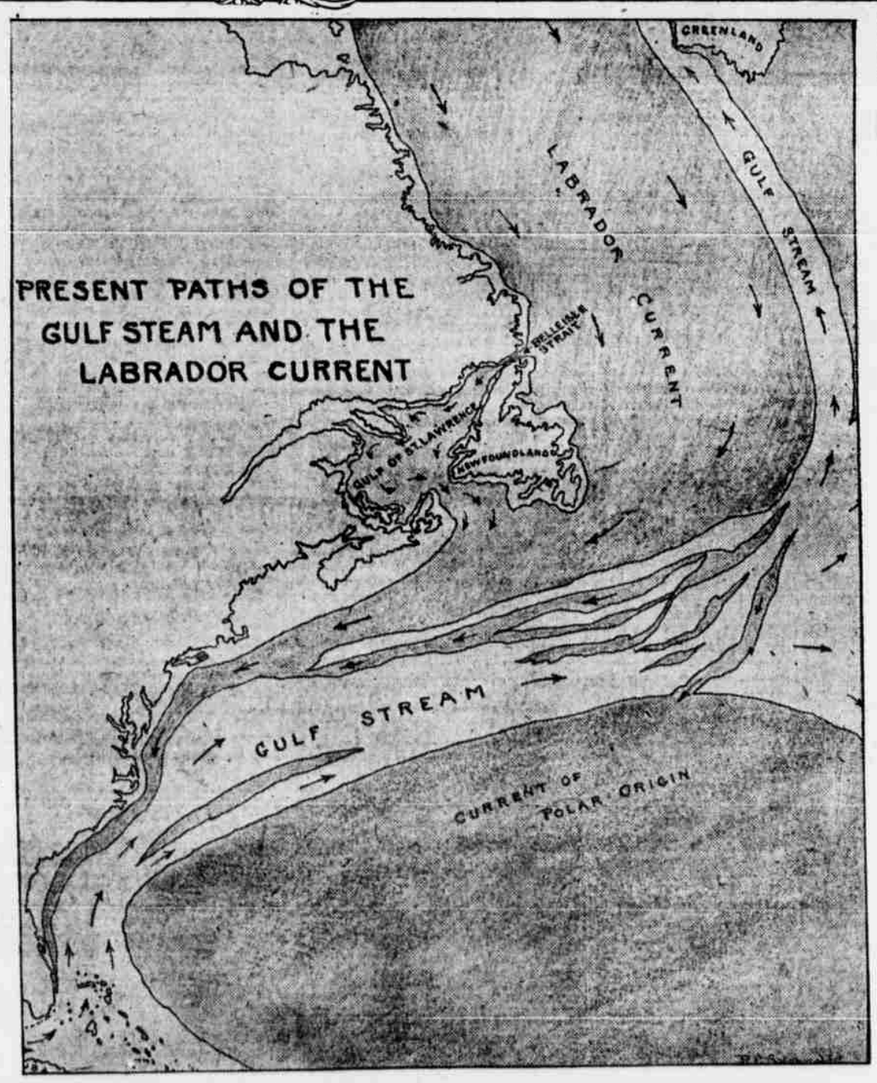
Imagine Greenland a region of smiling fields and agricultural abundance! And yet such is not unrealizable if Mr. Riker's jetty can arrest the present strife between the arctic and tropic floods off the coast of Newfoundland. Surely twenty millions of dollars is a small price to pay for the blessings that may be born of this engineering proposal. At least the people of Newfoundland are keenly alive to the need of corrective action of some sort. The American project seems to offer vaster and more far reaching benefits.





GRADUAL UPBUILDING *of the* GRAND BANK





WHAT DAMMING *the* BELLEISLE STRAIT *and* BUILDING *the* RIKER JETTY WOULD DO *to the* GULF STREAM *and* THE LABRADOR CURRENT.

Harlem's Public Forum

THE four corners at West 125th street and Seventh avenue have become as famous for public meetings as the Common in Boston and noted spots in other large cities. In the summer season meetings are held there nightly at which hundreds of interested citizens are attentive listeners.

The northwest corner is used almost exclusively by the Home for Friendless Boys, of which Harry Clinton Eva is the leader. This philanthropic worker has been doing work for this institution at this corner for the past nineteen years. Large crowds listen and the financial help derived from the collectiona has been substantial.

At the northeast corner the Socialists and Single Tax advocates hold forth. Some of these meetings at times have been stormy. Sometimes when the hecklers came along to bait the speakers arrests were made. For the last few weeks the friends of the Irish Republic have used the corner when the Socialists have not held their meetings. The crowds at times have been so large that it has been necessary for the police to clear the avenue and the sidewalk so pedestrians could pass. On the warm summer nights small groups of Socialists remain for hours after the speakers have gone, discussing their views.

The southeast corner is used mostly by the Salvation Army. These gatherings always are attended by many hundreds of religious workers. Many a poor unfortunate has been gathered into the fold by the army scouts who pass through the crowd looking for men who want to reform and lead a better life.

On the remaining corner, now that the campaign approaches, political speakers hold forth nightly. One night will be devoted to Democratic haranguers and the next night the Republicans will be heard. When all four corners are occupied at once with meetings the scene is lively indeed.

It has been estimated by the police that as many as 20,000 people have attended the meetings in a single week.